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June 13, 2014

Ray Basso
Jennifer LaPoma
U.S. Environmental Protection Agency, Region II
290 Broadway
New York, New York 10007-1866

Via Electronic Mail

**Re: Draft Lower Passaic River Study Area (LPRSA) Baseline Ecological Risk Assessment
- Administrative Agreement and Order on Consent for Remedial
Investigation/Feasibility Study - CERCLA Docket No. 02-2007-2009**

Dear Mr. Basso and Ms. LaPoma:

The Lower Passaic River Study Area (LPRSA) Cooperating Parties Group (CPG) is submitting the draft Baseline Ecological Risk Assessment (BERA) for the entire 17-mile LPRSA Remedial Investigation/Feasibility Study (RI/FS). The 17-mile LPRSA BERA has been prepared pursuant to the following documents:

- May 2007 Administrative Agreement and Order on Consent (AOC)
- August 2009 Region 2-approved Problem Formulation Document (PFD)
- Draft Risk Analysis and Risk Characterization work plan (RARC)

In addition, there have been multiple meetings and conference calls between the Region 2 and the CPG ecological risk assessors over the past several years to develop the approach for the BERA, including:

- **December 14 and 16, 2010 Meeting** – Region 2 and CPG representatives discussed a proposed approach to background and reference and finalized the "Term Sheets" memorializing agreement with Region 2 on the BERA approach.
- **February 15, 2011 Meeting** - Region 2 and CPG representatives met to discuss the background and reference approach for the entire 17-mile LPRSA.
- **February 3, 2012 meeting** - Region 2 and CPG representatives met to discuss and refine background and reference approach, which resulted in EPA's direction to develop quality assurance project plans (QAPPs) to sample upstream of Dundee Dam for background sediment and fish tissue and upstream of Dundee Dam reference sediment quality triad (SQT) samples for sediment chemistry, sediment toxicity tests, and benthic community taxonomy samples.
- **Fall 2012 Background/Reference QAPPs** – These Region 2-approved QAPPs (*Background Tissue Addendum to the Quality Assurance Project Plan: Fish and Decapod Crustacean Tissue Collection for Chemical Analysis and Fish Community Survey, Addendum No. 5* approved by EPA October 10, 2012

R. Basso & J. LaPoma
17-mile LPRSA BERA Submission
June 13, 2014
Page 2 of 5

[Windward 2012a] and *Background and Reference Conditions Addendum to the Quality Assurance Project Plan: Surface Sediment Chemical Analyses and Benthic Invertebrate Toxicity and Bioaccumulation Testing*, Addendum No. 5 approved by EPA October 26, 2012 [Windward 2012b]) were implemented to collect and analyze sediment (sediment chemistry, sediment toxicity, and benthic community) and fish tissue samples for background and reference purposes in the Upper Passaic River (UPR above Dundee Dam). The implementation of background and reference sampling in the UPR was conducted by the CPG under Region 2 oversight. The UPR background and reference sampling was analogous to the sediment and tissue sampling conducted by the CPG under the LPRSA 2009 *Fish and Decapod Crustacean Tissue Collection for Chemical Analysis and Fish Community Survey QAPP* approved by EPA August 6, 2009 [Windward 2009a], and the *Surface Sediment Chemical Analyses and Benthic Invertebrate Toxicity and Bioaccumulation Testing QAPP* approved by EPA October 8, 2009 [Windward 2009b].

- **June 28, 2013 Background and Reference Definitions** - Region 2 provided revised definitions of background and reference to the CPG for incorporation into the revised RARC.
- **August 8, 2013 Background and Reference Definitions Meeting** - Region 2 and CPG representatives met and discussed the background and reference definitions and the Appendix B of the RARC.

The CPG appreciates this collaborative working relationship on the ecological risk assessment issues with Region 2.

Revised RARC Response to Comments (RTC):

The CPG completed the draft BERA in accordance with the revised RARC, which was submitted to USEPA on October 29, 2013. The CPG received Region 2's comments on the draft Revised RARC on January 31, 2014. However, some of the January 31, 2014 comments are inconsistent with the Region 2-approved PFD and Region 2-approved QAPPs. Due to the inconsistency in Region 2's comments, the overlapping time frames for these comments and ongoing work on the BERA, and EPA's request that the draft BERA be submitted now, the following issues were not addressed in the draft BERA and require further discussion with Region 2 (see attached Revised RARC RTC):

- **Add acute water toxicity-based values** - The draft BERA utilized chronic values, which are more conservative than acute. The CPG agrees with USEPA that acute values could be added in a revised BERA deliverable; this change would not result in material changes to the BERA conclusions.

R. Basso & J. LaPoma
17-mile LPRSA BERA Submission
June 13, 2014
Page 3 of 5

- **Add additional metals to fish tissue evaluation** - Adding these additional metals would be inappropriate and inconsistent with the previously-approved PFD. As stated in the USEPA-approved PFD, when chemicals are metabolized or otherwise regulated by fish, a tissue approach is not appropriate for evaluation in fish tissue. As stated in the RARC Plan:

Tissue body burdens of most metals are biologically regulated, and it is difficult to develop broadly applicable tissue-residue toxicity thresholds for aquatic organisms for metals (except mercury and selenium), because of the wide range of strategies used by these organisms to store, detoxify, and excrete bioaccumulated metals. Furthermore, metals uptake rates, which strongly influence whether bioavailable metals levels in tissue may be toxic, are influenced by site-specific factors (Adams et al. 2011). In addition, the evaluation of PAHs using the critical tissue residue (CTR) approach for invertebrates is uncertain because rates of PAH metabolism vary widely within and between phyla of aquatic invertebrates (Meador et al. 1995).

Please see the attached Revised RARC RTC for more details.

- **Include carp in the risk characterization** - Inclusion of carp, an invasive species, in the risk characterization of the BERA is not appropriate or scientifically supported. The risk characterization section is focused on those identified species highlighted as part of the assessment endpoint for the LPRSA, which is focused on protection of fish populations. Many studies have linked carp to observable adverse impacts on aquatic habitats and the decreased suitability of those disturbed habitats for both aquatic and terrestrial wildlife. Carp was never selected as a focal species for protection in the BERA, and there are numerous other representatives of the feeding guild that includes carp. Please see the attached Revised RARC RTC for more details.
- **Refer to the carp as non-native rather than invasive** - The CPG does not agree with this comment and has not made this change in wording. The common carp was introduced by the Federal government to US waters in the 19th century. The common carp and other carp species are invasive by any definition of the word, for the reasons outlined in the attached RARC RTC. Federal and state governments have undertaken numerous studies and programs attempting to manage and eliminate carp such that the deleterious impacts are avoided. The common carp is a "biological stressor" under the EPA 1998 ecological risk guidance and is treated as such in the LPRSA draft BERA.
- **Change mink site use from "unknown" to "year round"** - There is no evidence of year-round use of the LPRSA by mink. To the contrary, the habitat is insufficient to

R. Basso & J. LaPoma
17-mile LPRSA BERA Submission
June 13, 2014
Page 4 of 5

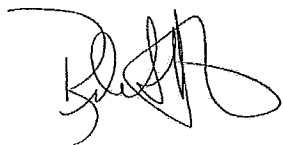
support a mink population, as documented in the BERA. Regardless, the CPG did use a site use factor of 1 as a conservative evaluation in the BERA.

The CPG requests that this letter be included in the Administrative Record for the 17-mile LPRSA operable unit of the Diamond Alkali Superfund Site.

If you have any questions, please contact me.

Very truly yours,

de maximis, inc.



Robert Law, Ph.D.
CPG Project Coordinator

Attachment

cc: Walter Mugdan, EPA Region 2
CPG Members
William Hyatt, CPG Coordinating Counsel
Willard Potter, *de maximis, inc.*

R. Basso & J. LaPoma
17-mile LPRSA BERA Submission
June 13, 2014
Page 5 of 5

References:

Windward. 2009a. Lower Passaic River Restoration Project. Lower Passaic River Study Area RI/FS. Quality Assurance Project Plan: Fish and decapod crustacean tissue collection for chemical analysis and fish community survey. Final. Prepared for Cooperating Parties Group, Newark, NJ. August 6, 2009. Windward Environmental LLC, Seattle, WA.

Windward. 2009b. Lower Passaic River Restoration Project. Lower Passaic River Study Area RI/FS. Quality Assurance Project Plan: Surface sediment chemical analyses and benthic invertebrate toxicity and bioaccumulation testing. Final. Prepared for Cooperating Parties Group, Newark, New Jersey. October 8, 2009. Windward Environmental LLC, Seattle, WA.

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CPG Responses to USEPA Comments (received January 31, 2014) on RARC Plan Submitted 10/29/13

No.	Section/Title	Comment	Response
1	General comment	Throughout the document, the term “toxicity threshold” was replaced with “effects threshold.” Please explain why this change was made.	No change in meaning was intended. Language in Section 2 has been changed globally back to “toxicity thresholds”.
2	Page 9, Section 1.3.3, third bullet	The following text was added to the third bullet, “...and, if available, fish health observations.” This text should be moved to a third bullet under reference datasets on the same page.	Text was revised as requested.
3a	Page 17, Table 2-1	The focal species listed for the benthic invertebrate community should include polychaetes (<i>Nereis virens</i>) and oligochaetes (<i>Lumbriculus variegatus</i>), for consistency with assessment endpoint 2.	Receptor species have been added to Table 2-1.
3b	Page 17, Table 2-1	Heron may or may not be migratory. As such, please perform two calculations for the heron, one using an area use factor of 1 and another using an area use factor of 0.58. This change should also be reflected in Table 2-2.	Footnote was added to Table 2-1 and Table 2-2 indicating that heron/egrets will be evaluated as both migratory and resident species using difference area use factors.
4	Pages 19 to 24, Table 2-2	The previous version of this report made several references to 2010 and planned 2011 data. The table now refers to 2011–2012 data. Should this be 2010–2012 data? Please verify.	No change was made. Table refers to surface water data collected as part of the CPG routine monitoring sampling events, which began in 2011 (not 2010).
5	Page 35, Section 2.3.1.2, first sentence	Please insert “acute and chronic” in front of “...water toxicity-based values.” This language should also be inserted on Page 36 and Page 40, as appropriate.	No change made. Acute values will be added to the next version of the BERA.
6	Page 36, Section 2.3.1.3	Bivalve mollusks (<i>Geukensia demissa</i> and <i>Elliptio complanata</i>) should be included in the bulleted list of receptors, pursuant to Assessment Endpoint No. 4.	Bivalve mollusks were added to the bulleted list of receptors for evaluation using tissue residues.

CPG Responses to USEPA Comments (received January 31, 2014) on RARC Plan Submitted 10/29/13

No.	Section/Title	Comment	Response
7	Page 36, Section 2.3.1.3 and Page 38, Section 2.3.1.4	All metals, not just mercury and selenium, should be included in the evaluation. The rationale for including only 2 metals may be discussed in the uncertainty section of the BERA, but all metals should be included in the initial evaluation.	<p>No change made. As stated in footnote e of Table 5-2 in the USEPA-approved PFD, for chemicals that are metabolized or otherwise regulated by fish, a tissue response approach is not appropriate. As stated in the RARC plan:</p> <p>“Tissue body burdens of most metals are biologically regulated, and it is difficult to develop broadly applicable tissue-residue toxicity thresholds for aquatic organisms for metals (except mercury and selenium), because of the wide range of strategies used by these organisms to store, detoxify, and excrete bioaccumulated metals. Furthermore, metals uptake rates, which strongly influence whether bioavailable metals levels in tissue may be toxic, are influenced by site-specific factors (Adams et al. 2011). In addition, the evaluation of PAHs using the critical tissue residue (CTR) approach for invertebrates is uncertain because rates of PAH metabolism vary widely within and between phyla of aquatic invertebrates (Meador et al. 1995).”</p> <p>Specifically, the impact of a metal is related to the amount of metabolically active accumulated metal, which is influenced by the rate of uptake of the metal and the rate of removal from the metabolically active pool via detoxification and storage, as well as elimination, which in turn is dependent on the bioavailable concentration (food and water) as influenced by site specific conditions (biotic and abiotic). Thus, whole body metal residues generally change with exposure due to the dynamic nature of metal uptake and elimination, and due to internal partitioning of bioaccumulated metal (Luoma and Rainbow 2005). Consequently, on a whole body basis, the toxicity threshold for a species that actively regulates a metal is expected to be much lower than in a species that retains the excess metal, but stores it in a detoxified form.</p>

CPG Responses to USEPA Comments (received January 31, 2014) on RARC Plan Submitted 10/29/13

No.	Section/Title	Comment	Response
8a	Page 38, footnotes 11 and 12	These footnotes were added in the revised document to indicate that white sucker and carp were not identified as ecological receptors in the PFD and will be discussed in the uncertainty section of the BERA. EPA does not agree with this approach – they should both be discussed in the risk characterization section of the BERA as well as the uncertainty section.	<p>The footnote regarding white sucker was deleted. White sucker will be evaluated as an alternate species for the invertivore feeding guild, although this species was not selected as a receptor in the PFD.</p> <p>Carp; however, will not be discussed in the risk characterization section of the BERA. Carp were not selected as a receptor in the PFD and the protection of this invasive species is not warranted. Many studies have linked common carp to observable adverse impacts on aquatic habitats and the decreased suitability of those disturbed habitats for both aquatic and terrestrial wildlife. The LPRSA is known to be degraded by multiple stressors common to urban streams (e.g., impaired water quality, organic and inorganic nutrient enrichment, presence of invasive species), and it is likely that common carp may actively contribute to the impairment of water quality and the alteration of the benthic invertebrate community in the LPRSA. These effects are attributed to the carp's method of feeding, which aggressively disturb surface sediment and increases turbidity. This behavior results in reduced biomass and diversity of submerged vegetation and can lead to shifts in the autotrophic community away from submerged aquatic vegetation and filamentous algae toward suspended algae (Chumchal et al. 2005; Weber and Brown 2011; Wahl et al. 2011). Impacts on benthic invertebrates due to carp activity can result in a community-level shift from benthic invertebrate species that utilize SAV for food or refuge (i.e., detritivore or omnivore species, such as gastropods and crustaceans) to those that consume organic carbon directly from sediment and/or burrow into sediment (i.e., tube-dwelling chironomids and deposit feeders, such as annelids) (Miller and Crowl 2006).</p> <p>Consistent re-suspension of sediment and egestion can result in an increase in available phosphorus and nitrogen (Chumchal et al. 2005), which can foster rapidly growing unicellular algae (Chumchal et al. 2005; Weber and Brown 2011) that can further diminish light penetration, thereby creating a positive feedback loop that disfavors submerged vegetation. As a result, the benthic community can shift from species that utilize submerged vegetation for food or refuge (e.g., amphipods and decapods) (Carey and Wahl 2010; Hinojosa-Garro and Zambrano 2004; Parkos et al. 2003; Wahl et al. 2011) toward species that consume organic carbon (OC) directly from sediment (i.e., oligochaetes and chironomids). A number of jurisdictions have determined that carp are so detrimental to a functioning ecosystem that aggressive eradication programs have been introduced to control carp and their impacts on other species and habitat (Industry & Investment NSW 2010; Loughheed et al. 2004; Roberts and Tilzey 1997; Stuart and Jones 2002).</p>
8b	Page 38, footnotes 11 and 12	In Footnote 12, carp should be referred to as “non-native” rather than “invasive.”	No change made. Common carp are known to have adverse effects on ecosystems highly tolerant of pollution and urban areas and are often referred to as pest or nuisance species. Since they have deleterious effects on the aquatic systems, they are considered invasive species. See response to comment 8a.
9	Page 48, third and fourth paragraphs, and footnotes 17 and 18	Additional text was added in the revised document indicating that the CPG may use species sensitivity distributions to develop effect thresholds if sufficient data are available. EPA should be consulted prior to doing this.	No change made to the document. Per discussions with USEPA on February 6, 2014 the CPG will add species sensitivity distributions where sufficient toxicity data are available and/or when the original toxicity screening level used was not sufficiently supported by literature for ecological receptors (e.g., a threshold based on bioaccumulation instead of direct effects, or a threshold based on human health FDA levels).

CPG Responses to USEPA Comments (received January 31, 2014) on RARC Plan Submitted 10/29/13

No.	Section/Title	Comment	Response
10	Page 56, first paragraph of Section 2.5.1.2	The following text was added to the revised document "The proposed methods for the SQT evaluation may need to be revised based on the results of the SQT evaluation". This statement should be deleted. If there is an issue that is encountered during the evaluation, EPA should be consulted to resolve the issue.	Sentence was deleted as requested.
11a	Page 58, first bullet under Data Preparation	The CPG proposes designating as toxic only those sediments that have a response greater than the 90 th percentile of the MSD for a given endpoint, as per Phillips et al. 2001. EPA would like to discuss this approach. While it appears to be valid from a theoretical/statistical standpoint, some questions remain about how it would be implemented, whether it fits in with other statistical comparison tests presented in the RARC, and whether it meets the project-specific data quality objectives, particularly with regard to the allowable false negative error rate.	Language has been deleted stating that the data will be normalized to the 90th MSD. Since the submittal of this draft of the RARC plan, USEPA and CPG have identified appropriate reference condition locations for comparison to LPRSA sediment toxicity data. Therefore, the comparison to the 90th MSD is no longer needed.
11b	Page 58, first bullet under Data Preparation	In addition, the bullet states "Normalization of toxicity responses to negative control responses". Normalizing toxicity test results to the lab control is not recommended as often times when results are control corrected, the data may actually "double-dip". In other words, by adjusting site samples to reflect control endpoints (e.g., mortality), you introduce the potential to "hide" any indication of toxicity or produce false positives in site samples that prior to control adjustment, indicated toxic effects. The purpose of the lab control is to evaluate the health of each batch of organisms run concurrently with each test in order to prevent false negative results (i.e., test indicates toxicity when in fact mortality is due to poor organism health). In the absence of reference samples, it may be appropriate to statistically compare site samples to the lab control, but not to adjust the results. Recommend that the test result not be adjusted to the lab control.	No change was made to the document. CPG and USEPA met on February 6, 2014 to discuss this comment. CPG reminded USEPA that control normalized data is regularly done as part of benthic assessments. Normalization to batch control is important when the data sets have multiple batches. NOAA regularly does this as part of their assessments and the REMAP and Jamaica Bay data (a reference location for the LPRSA) are all reported as control normalized.
12	Page 73, first paragraph, second sentence	While Route 21 may limit access to the river, it does not completely restrict access. Anglers have been observed accessing the river from Route 21.	Language in sentence was changed from "restricted" to "limited".

CPG Responses to USEPA Comments (received January 31, 2014) on RARC Plan Submitted 10/29/13

No.	Section/Title	Comment	Response
13	Page 115, Section 3.3.5.2	If the CPG determines they would like to use any modeled future EPCs, this should be discussed with EPA prior to inclusion in the draft document.	Comment noted.
14	Page 116 to 117, Section 3.4	Note that EPA should be consulted prior to using any PPRTV Appendix values.	The last sentence in Section 3.4 states that any third-tier and surrogate dose-response values proposed for inclusion in the baseline HHRA will be submitted to USEPA Region 2 for approval prior to their use. CPG would like to note that toxicity values proposed for use in the baseline HHRA, including PPRTV Appendix values, were submitted to EPA for review on 2/7/14.
15	Appendix A	A minor editorial change is suggested. "COPC" is placed before "COPEC" Selection in the title of the Appendix A and throughout the Introduction. However, the order is reversed when they are discussed in the following Section 2 (COPEC) and Section 3 (COPC). This should be made consistent to avoid confusion.	The order was changed to say "COPEC" before "COPC" in the title and language in the introduction to match the order presented in Sections 2 and 3.
16	Appendix A, page two, first paragraph	The word "urban" is used in connection with the word "reference" several times. This is inconsistent with the agreement reached between EPA and the CPG during the dispute resolution process. Please remove the word urban.	The word "urban" has been removed and language regarding background and reference data has been revised to reflect the text in the main RARC plan document.
17	Appendix A, page 3	The document refers to submittal of the TRV document, in prep. At this point, it is EPA's understanding that the TRV document will be submitted with the draft BERA report. If you intend to submit something sooner, please advise.	The TRV document was submitted to USEPA on August 10, 2011. Minor revisions have been made to that document (based on more recent published TRV studies) and the revised TRV document will be included as an attachment to the BERA. A footnote was added stating that the TRV Deliverable will be included as an attachment to the BERA.
18	Appendix B, Page 3, third paragraph, last sentence	Fish health should be a reference, not a background.	Text has been revised to include fish health assessments as part of reference (fourth paragraph) and not part of background (deleted from third paragraph).
19	Appendix B, Page 4, Section 2.2	The text included in this section on Reference is not consistent with that submitted by EPA for inclusion in the report. While EPA's text was included as an attachment, it should be used in this section as well.	The additional language regarding reference as included in EPA's text was added to Section 2.2.
20	Appendix B, page 6, first sentence	Please clarify that the CPG is considering supplementing the current database with existing data from the New York/New Jersey harbor estuary, and that it is not recommending the collection of additional data.	It is correct that the CPG would supplement the current database with existing data from the New York/New Jersey harbor estuary and is not recommending the collection of additional data. The word "existing" has been added to text (page 6, first sentence).

CPG Responses to USEPA Comments (received January 31, 2014) on RARC Plan Submitted 10/29/13

No.	Section/Title	Comment	Response
21	Appendix B, page 6, sixth and eight bullets	Use of the word “urban” to characterize habitats in the Mullica River seems incorrect, and should be replaced with “rural” to be consistent with the bullets summarizing the data for freshwater samples. Please revise accordingly.	Language was revised as requested.
22a	Appendix B, Table 1	Measurement Endpoint 2d – please add control data to the last column.	No change was made. Consistent with comment no. 11a, toxicity data will no longer be normalized to the 90th MSD of control data.
22b	Appendix B, Table 1	Measurement Endpoint 5c – this should be changed to reference, not background.	Language was revised as requested.
23	Appendix C, page 119, Table 16-1	As per EPAs comments dated April 13, 2012, seasonal use for mink should be identified as “year-round”. The revised Table 16-1 shows a LPR seasonal use of “unknown”. Please revise to read “year-round”.	No change without further discussion with USEPA. The CPG is unaware of any data documenting the presence of mink on the LPRSA other than the tracks noted in August 2010 in the summer avian survey up near Dundee Dam. An evaluation of mink habitat will be provided as part of the BERA.

CPG Responses to USEPA Comments (received January 31, 2014) on RARC Plan Submitted 10/29/13

References

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